

REMARKS

Claims 1, 6-32, 58-65, 70-80, 90, 95-104 and 135-153 are pending. Claims 1, 6-16, 65, 70-80, 90, 95-104, 138, 139, 141 and 144-153 are under examination. Withdrawn claims 17-32, 58-64, 135-137, 140 and 142 have been canceled without prejudice to Applicants pursuing these claims in a related application. Claims 10, 12 and 14 have also been canceled. Claims 1, 65, 74, 76, 78, 90, 98, 100, 102, 138, 141 and 144 have been amended. New claims 154-189 have been added. Support for the amendments and new claims can be found throughout the specification and the claims as filed. In particular, support for the amendment to claims 1, 65, 90, 138, 141 and 144 can be found, for example, on page 21, lines 8-29, which indicates that a multidimensional coordinate point is defined by "n" parameters, where n is the number of molecules in a sample of molecules and each parameter is the level of expression of a molecule in the sample. Support for the amendment can also be found on page 3, line 22, to page 4, line 14, and Figures 1 and 2, which exemplify two-dimensional and three-dimensional space of n molecules, where n is two and three molecules, respectively; and on page 63, line 12, to page 66, line 15, which describes multidimensional space and exemplifies two-dimensional, three-dimensional and multidimensional coordinate points representative of the expression levels of n molecules in an individual. Support for new claims 154-189 can be found, for example, on page 45, line 22, to page 46, line 4. Accordingly, these amendments and new claims do not raise an issue of new matter and entry thereof is respectfully requested.

Objection to the Claims

The objection to claims 10, 12, 14, 74, 76, 78, 98, 100 and 102 for depending from canceled claims is respectfully traversed. Applicants respectfully submit that the objection has been rendered moot by the cancellation of claims 10, 12 and 14 and the amendment of claims 74, 76, 78, 98, 100 and 102 to depend from pending claims. Accordingly, Applicants respectfully request that the objection be withdrawn.

Rejection Under 35 U.S.C. § 101

The rejection of claims 1, 6-9, 11, 13, 15 and 16 under 35 U.S.C. § 101 as allegedly directed to non-statutory subject matter is respectfully traversed. Applicants respectfully submit that the claims are directed to statutory subject matter.

Referring to MPEP §2106, “[T]he claimed invention as a whole must accomplish a practical utility. That is, it must produce a ‘useful, concrete and tangible result’... Accordingly, a complete disclosure should contain some indication of the practical application of the claimed invention, i.e., why the applicant believes the claimed invention is useful” (MPEP § 2106(A)). Applicants respectfully submit that claim 1 is directed to statutory subject matter that has a practical utility. Claim 1 is directed to a method of determining a comparative expression profile by determining whether a multidimensional coordinate point representative of the expression levels of a sample of n molecules is within a health-associated expression region and has a reference expression profile or is outside of the health-associated reference expression region and has a perturbed expression profile. As taught in the specification, a “health-associated reference expression region” refers to a region of multidimensional space that is representative of the expression levels of a sample of molecules in a population of reference individuals” (page 20, lines 20-24). The specification further teaches that a “reference individual” refers to an individual selected for comparison using defined criteria such as being healthy, having a particular gender, ethnic background, presence of disease or any criteria useful for comparing the health state of an individual (page 22, lines 8-25). The methods are useful for determining whether an individual has a health state similar to that of the reference population and can be used to predict the health state of an individual by determining whether the individual has a reference expression profile indicative of a reference health state, such as a healthy state, or a perturbed expression profile indicative of a potential disease state in the individual or of a predisposition to developing a disease (page 6, lines 8-28). Accordingly, Applicants respectfully submit that the specification provides sufficient description and guidance that the claimed methods produce a useful, concrete and tangible result and accomplishes a practical application. Therefore, Applicants respectfully request that this rejection be withdrawn.

Rejection Under 35 U.S.C. § 112, First Paragraph

The rejection of claims 1, 6-16, 65, 70-80, 90, 95-104, 138, 139, 141 and 144-153 under 35 U.S.C. § 112, first paragraph, as allegedly lacking enablement is respectfully traversed. Applicants respectfully maintain that the specification provides sufficient description and guidance to enable the claimed methods.

Applicants maintain, for the reasons of record, that the claimed methods are sufficiently enabled by the teachings in the specification. The specification teaches a variety of methods enabling one skilled in the art to make and use the invention as claimed. In particular, the specification teaches that the methods of the invention can be used to diagnose the health state or disease state of an individual using the expression levels of molecules (page 11, lines 16-29). An individual having expression levels of molecules that fall within a health-associated reference expression region indicates a reference expression profile. An individual having molecules with expression levels outside the health-associated reference expression region indicates a perturbed health state, which can be a disease state. The specification also teaches that methods of the invention use a statistically determined health-associated reference expression region of molecules indicative of expression levels of molecules in a population of molecules having a selected health state (page 12, line 19, to page 13, line 8). The expression levels of molecules in a specimen from an individual can be compared to the statistically determined health-associated reference expression region to determine a comparative expression profile of the individual relative to the reference population. The determination of the reference expression region of a variety of molecules provides a basis for comparing any individual to determine if the individual has one or more molecules with aberrant expression or molecules having aberrant relative expression. Thus, the determination of a health-associated reference expression region for any number of molecules expressed in a cell provides a central repository of information, which can be accessed by a variety of means to determine a comparative expression profile of an individual.

The specification also teaches various statistical methods for determining the health state of an individual (page 12, line 19, to page 13, line 13; page 19, line 28, to page 21, line 29; page 23, line 13, to page 25, line 17; and page 39, line 22, to page 44, line 26). The specification

additionally teaches methods for selecting a reference population and a sample of molecules predictive of the health state of an individual (page 70, line 1, to page 79, line 6).

In the Office Action on page 4, it is stated that one skilled in the art has to know which individual is healthy and which is not in order to practice the method. However, Applicants respectfully submit that it is well known to those skilled in the art how to determine whether an individual is considered healthy for the purpose of inclusion in a reference population or has some condition that is desired for a reference population. For example, the specification teaches that one skilled in the art can readily determine criteria suitable for inclusion of an individual as a reference individual for a particular application (page 22, lines 10-13). The specification also teaches that a reference individual can be a healthy individual who is in good health and essentially disease free and can be readily determined by one skilled in the art based on subjective feelings of well being of the individual and objective signs of disease (page 22, line 16, to page 23, line 12). It is well known that the skilled artisan physician can readily make a determination as to the health state of an individual or determination of other relevant criteria for a reference population (page 22, lines 16-25).

Moreover, Applicants respectfully disagree with the assertion in the Office Action that one needs to know what expression levels of molecules are indicative of healthy and diseased individuals (paragraph bridging pages 4 and 5). Applicants further disagree with the assertion on page 5 of the Office Action that one needs to know relevant genes or molecules associated with the disease. To the contrary, the specification teaches that it is not necessary to know or determine the identity of the molecules for which the expression levels are determined, only that a specimen molecule has a measurable expression level correlated with the health state of the individual (page 44, line 27, to page 45, line 7).

With regard to the assertion in the Office Action that one has to know how to determine expression levels and appropriate assay methods, Applicants respectfully submit that such methods are well known to those skilled in the art. The specification teaches various methods for determining the expression levels of molecules, including nucleic acids, polypeptides, small molecules, and the like (page 85, line 15, to page 112, line 18). Moreover, such methods for determining nucleic acid and protein expression levels are also described, for example, in the

cited references Friend et al., U.S. Patent 6,324,479, Friend et al., U.S. 2001/0018182, Prashar et al., WO 99/57130, and Bao et al., U.S. Patent No. 6,251,601. Therefore, Applicants respectfully submit that methods of determining expression levels and assay methods were well known to those skilled in the art.

Applicants respectfully maintain that the specification provides sufficient description and guidance to enable the claimed methods. Accordingly, Applicants respectfully request that this rejection be withdrawn.

Rejection Under 35 U.S.C. § 112, Second Paragraph

The rejection of claims 1, 6-9, 11, 13, 15, 16, 65, 70-73, 75, 77, 79, 80, 90, 95-97, 99, 101, 103, 104, 138, 139, 141 and 144-153 under 35 U.S.C. § 112, second paragraph, is respectfully traversed. Applicants respectfully maintain, for the reasons of record, that the claims are clear and definite.

Applicants respectfully maintain that one skilled in the art would have readily understood the meaning of the term “comparing” based on what was well known to those skilled in the art. Applicants respectfully submit that the concept of comparing values such as expression levels or a multidimensional coordinate point representative of those values to a statistically determined reference is a fundamental scientific concept applicable in all disciplines of science. The specification teaches that the methods of the invention use statistical analysis of the expression levels of molecules in a reference population of individuals to predetermine a health-associated reference expression region of molecules as they vary in the reference population and, further, that such a health-associated reference expression region can be used to compare the expression level of molecules in an individual as a diagnostic method to determine the health state of the individual (page 10, line 26, to page 11, line 5). The specification additionally teaches various statistical methods for determining the health state of an individual (page 12, line 19, to page 13, line 13; page 19, line 28, to page 21, line 29; page 23, line 13, to page 25, line 17; and page 39, line 22, to page 44, line 26). Applicants respectfully maintain that one skilled in the art would readily understand how to compare a representation of values such as a multidimensional coordinate point to a reference such as a health-associated reference expression region using well known statistical methods. As acknowledged in the Office Action on page 7, even Friend et al., U.S. Patent No.

6,324,479, corroborates Applicants' position that the term "comparing" is well known to one skilled in the art in that Friend et al. describes comparing a diagnostic profile obtained by measuring gene or protein abundances (see, for example, column 3, lines 5-12, and throughout the specification).

Applicants respectfully maintain that, based on the teachings in the specification and what was well known in the art, one skilled in the art would readily understand the meaning of the term "comparing." Accordingly, Applicants respectfully maintain that the claims are clear and definite and respectfully request that this rejection be withdrawn.

Rejections Under 35 U.S.C. § 102

The rejection of claims 1, 6-8, 11, 13, 15, 16, 65, 70-72, 75, 77, 79, 80, 90, 95, 96, 99, 101, 103, 104, 138, 139 and 141 under 35 U.S.C. § 102(e) as allegedly anticipated by Friend et al., U.S. Patent No. 6,324,479 (hereinafter Friend '479), is respectfully traversed. Applicants respectfully maintain, for the reasons of record, that the claims are novel over Friend '479.

Applicants maintain that Friend '479 does not teach the claimed methods. Claims 1, 65, 90, 138 and 141 have been amended to recite the step of creating a multidimensional space of n dimensions, wherein n represents the number of molecules being analyzed in a specimen from each individual in a population of reference individuals. As discussed in the Rule 132 Declaration filed with the response mailed November 16, 2004, Friend '479 describes using unidimensional analysis, in contrast to the claimed invention that uses multidimensional analysis. As taught in the specification, a "multidimensional coordinate point" refers to a coordinate defined by " n " parameters, where n is the number of molecules in a sample of molecules and each parameter is the level of expression of a molecule in the sample (page 21, lines 8-12). The specification teaches exemplary multidimensional spaces containing multidimensional coordinate points in Figures 1 and 2. For example, Figure 1 shows a representative multidimensional space of two dimensions, where each circle represents a multidimensional coordinate point representative of the expression levels of two molecules in an individual (page 64, lines 1-10). Figure 2 shows a representative multidimensional space of three dimensions, where each circle represents a multidimensional coordinate point representative of the expression levels of three molecules in an individual (page 65, lines 15-23). The specification further

teaches that similar analysis can be applied in n-dimensional space, where n is the number of molecules in a sample of molecules from an individual (page 66, lines 3-7).

The specification additionally teaches the distinction between “one-molecule-at-a-time” analysis, that is, unidimensional analysis, of multiple parameters and multidimensional analysis, as recited in the claims (page 63, lines 8-30). “Instead of comparing the expression levels of individual molecules of a sample to the corresponding health-associated reference expression intervals determined for a reference population, as in one-molecule-at-a-time analysis, the expression level of each molecule in the sample is compared to other molecules in the sample in a multidimensional analysis” (page 63, lines 15-21). Thus, the specification clearly teaches that one-molecule-at-a-time analysis, i.e., unidimensional analysis, is distinct from multidimensional analysis. Accordingly, Applicants respectfully submit that the claims reciting “creating a multidimensional space of n dimensions, wherein n represents the number of molecules being analyzed,” “determining a multidimensional coordinate point” and “determining a health-associated reference expression region” are distinct from the unidimensional analysis described in Friend ‘479. As discussed in the Declaration filed with the previous response, the interpolated response curves of Friend ‘479 are unidimensional functions, meaning univariate functions, or functions of a single variable, and each such unidimensional function is for a single cellular constituent, i.e. molecule (paragraph 4). Thus, Applicants respectfully maintain that the claimed methods using multidimensional analysis are distinct from the unidimensional analysis described in Friend ‘479. Although Figures 1, 2 and 4 of Friend ‘479 referred to in the Office Action are two-dimensional graphical representations, this is not multidimensional analysis but rather unidimensional analysis, as discussed in the Declaration filed with the previous response.

With regard to the Declaration filed with the previous response, Applicants respectfully submit that the Declaration submitted with the previous response provided the expert opinion of Dr. Hood and Dr. Siegel regarding unidimensional analysis described in Friend ‘479 and Friend ‘182 and the distinctions of Friend ‘479 and Friend ‘182 over the claimed methods directed to multidimensional analysis. As evidence of the expertise of Dr. Hood and Dr. Siegel, attached herewith as Exhibits A and B are their respective curricula vitae. Applicants respectfully submit that the Declaration filed with the previous response should be considered as corroborative evidence of

the distinctions of the claimed methods over Friend '479 and Friend '182 and respectfully request reconsideration of the Declaration in light of the distinctions discussed above and below.

Applicants maintain that the claimed methods, computer apparatus and computer-readable medium are novel over Friend '479. Accordingly, Applicants respectfully request that this rejection be withdrawn.

The rejection of claims 1, 6-8, 11, 13, 15, 16, 65, 70-72, 75, 77, 79, 80, 90, 95, 96, 99, 101, 103, 104, 138, 139 and 141 under 35 U.S.C. § 102(e) as allegedly anticipated by Friend, U.S. 2001/0018182 (hereinafter Friend '182), is respectfully traversed. Applicants respectfully maintain, for the reasons of record, that the claims are novel over Friend '182.

As discussed above, claims 1, 65, 90, 138 and 141 have been amended to recite the step of creating a multidimensional space of n dimensions, wherein n represents the number of molecules being analyzed in a specimen from each individual in a population of reference individuals. Applicants respectfully submit that the claims reciting "creating a multidimensional space of n dimensions, wherein n represents the number of molecules being analyzed," "determining a multidimensional coordinate point" and "determining a health-associated reference expression region" are distinct from the unidimensional analysis described in Friend '182. Further as discussed above, Applicants respectfully submit that the Declaration filed with the previous response corroborates the distinction of the claims over Friend '182. Accordingly, Applicants respectfully maintain that the claimed methods, computer apparatus and computer-readable medium are novel over Friend '182 and, therefore, respectfully request that this rejection be withdrawn.

The rejection of claims 1, 6-16, 65, 70-80, 90, 95-104, 138, 139, 141 and 144-153 under 35 U.S.C. § 102(b) as allegedly anticipated by Prashar et al., WO 99/57130, is respectfully traversed. Applicants respectfully submit that the claims are novel over Prashar et al.

As discussed above, claims 1, 65, 90, 138 and 141, as well as claim 144, have been amended to recite the step of creating a multidimensional space of n dimensions, wherein n represents the number of molecules being analyzed in a specimen from each individual in a population of reference individuals. Applicants respectfully submit that the multidimensional analysis of the claims is distinct from the analysis described in Prashar et al. With respect to the

three-dimensional graphical representation of gene expression shown in Figures 2A-C referenced in the Office Action, Figures 2A and 2B represent autoradiograms of the expression profiles generated from cDNAs made with RNA isolated from control Jurkat lymphocytes (Figure 2A) and human T lymphocytes (Figure 2B) incubated with ionomycin and diC8 (page 8, lines 11-14; page 38, lines 2-7). Thus, the three-dimensional graphical representations of Figure 2 are clearly a scan of autoradiograms (Figures 2A and 2B) or a graphical representation of the differences in gene expression between the scans of Figures 2A and 2B (Figure 2C), where the “x” and “y” dimensions are the relative position of the autoradiogram (see Figure 1) and the “z” axis shows the peaks representative of the scanned intensities of the spots on the autoradiogram. Such a representation is clearly not the multidimensional statistical analysis of the amended claims, as discussed above. Applicants respectfully submit that the claims reciting “creating a multidimensional space of n dimensions, wherein n represents the number of molecules being analyzed,” “determining a multidimensional coordinate point” and “determining a health-associated reference expression region” are distinct from the description in Prashar et al.

Applicants respectfully submit that Prashar et al. does not teach the use of multidimensional analysis, as in Applicants’ claims. Absent such a teaching, Applicants respectfully submit that the claimed methods, computer apparatus and computer-readable medium are novel over Prashar et al. Accordingly, Applicants respectfully request that this rejection be withdrawn.

The rejection of claims 65, 70-72, 75, 77, 80, 90, 95, 96, 99, 101 and 104 under 35 U.S.C. § 102(a) as allegedly anticipated by Levine et al., U.S. Patent No. 6,020,135, is respectfully traversed. Applicants respectfully submit that the claims are novel over Levine et al.

As discussed above, claims 65 and 90 have been amended to recite the step of creating a multidimensional space of n dimensions, wherein n represents the number of molecules being analyzed in a specimen from each individual in a population of reference individuals. Applicants respectfully submit that the claimed methods reciting “creating a multidimensional space of n dimensions, wherein n represents the number of molecules being analyzed,” “determining a multidimensional coordinate point” and “determining a health-associated reference expression region” are distinct from the analysis described in Levine et al.

Applicants respectfully submit that Levine et al. does not teach the use of multidimensional analysis, as in Applicants' claims. Absent such a teaching, Applicants respectfully submit that the claimed methods are novel over Levine et al. Accordingly, Applicants respectfully request that this rejection be withdrawn.

The rejection of claims 1, 6-9, 11, 13, 15, 16, 65, 70-73, 75, 77, 79, 80, 90, 95-97, 99, 101, 103, 104, 138, 139, 141, 144-149, 152 and 153 under 35 U.S.C. § 102(a) as allegedly anticipated by Bao et al., U.S. Patent No. 6,251,601, is respectfully traversed. Applicants respectfully submit that the claims are novel over Bao et al.

As discussed above, claims 1, 65, 90, 138, 141 and 144 have been amended to recite the step of creating a multidimensional space of n dimensions, wherein n represents the number of molecules being analyzed in a specimen from each individual in a population of reference individuals. Applicants respectfully submit that the claims reciting "creating a multidimensional space of n dimensions, wherein n represents the number of molecules being analyzed," "determining a multidimensional coordinate point" and "determining a health-associated reference expression region" are distinct from the analysis described in Bao et al. With respect to the graphical representations shown in Figure 2, which are asserted in the Office Action to disclose multidimensional analysis, this figure shows graphs of various ratios of cell line DNA to genomic DNA but does not demonstrate multidimensional statistical analysis, as Applicants have claimed.

Applicants respectfully submit that Bao et al. does not teach the use of multidimensional analysis, as in Applicants' claims. Absent such a teaching, Applicants respectfully submit that the claimed methods, computer apparatus and computer-readable medium are novel over Bao et al. Accordingly, Applicants respectfully request that this rejection be withdrawn.

In light of the amendments and remarks herein, Applicants submit that the claims are now in condition for allowance and respectfully request a notice to this effect. The Examiner is invited to call the undersigned agent if there are any questions.

09/724,898

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 502624 and please credit any excess fees to such deposit account.

Respectfully submitted,

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EXHIBIT A



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Date and Place of Birth: Missoula, Montana - October 10, 1938

Citizenship: United States

Marital Status: Married 1963, two children

Education:

1960 - B.S. California Institute of Technology (Biology)
1964 - M.D. The Johns Hopkins School of Medicine (Medicine)
1968 - Ph.D. California Institute of Technology (Biochemistry) - Immunoglobulins:
Structure, Genetics, and Evolution

Professional Experience:

1963 - 1964 NIH Predoctoral Fellowship, California Institute of Technology
1964 - 1967 NIH Postdoctoral Fellowship, California Institute of Technology
1967 - 1970 Senior Investigator, Immunology Branch, GL&C, NCI, National Institutes of Health, Bethesda, MD
1970 - 1973 Assistant Professor of Biology, California Institute of Technology
1973 - 1975 Associate Professor of Biology, California Institute of Technology
1975 - 1977 Professor of Biology, California Institute of Technology
1977 - 1992 Bowles Professor of Biology, California Institute of Technology
1980 - 1989 Chairman, Division of Biology, California Institute of Technology
1981 - 1990 Director, Cancer Center, California Institute of Technology
1989 - 1992 Director, NSF Science and Technology Center for Molecular Biotechnology, California Institute of Technology
1992-2000 Director, NSF Science and Technology Center for Molecular Biotechnology, University of Washington
1992-1999 William Gates III Professor, Chairman & Founder, Department of Molecular Biotechnology, School of Medicine, University of Washington
1992-1999 Professor, Departments of Bioengineering and Immunology; Adjunct Professor, Departments of Medicine and Computer Science, University of Washington
1992-Present Visiting Associate in Biology, California Institute of Technology
1999-Present Professor at Large, Keck Graduate Institute of Applied Life Sciences
1999-Present President and Founder, Institute for Systems Biology

- 2000-Present Affiliate Professor, Departments of Bioengineering, Computer Science, and Immunology, University of Washington
- 2002-Present Affiliate Professor, Department of Microbiology & Immunology, University of British Columbia
- 2004-Present Full Faculty Member, University of Washington Molecular and Cellular Biology Program

Academic and Professional Honors:

- 1960 Hinrichs Memorial Award, Caltech: Outstanding Student Leader
- 1960 B.S. with Honors, Caltech
- 1963 Alpha Omega Alpha, Johns Hopkins Medical School
- 1971-76 NIH Career Development Award
- 1974 Camille and Henry Dreyfus Teacher-Scholar Grant
- 1977 Endowed Professorship: The Ethel Wilson Bowles and Robert Bowles Professor of Biology
- 1980 Howard Taylor Ricketts Medal, University of Chicago: Outstanding Accomplishment in the Medical Sciences
- 1981 Bridges Award, ARCS Foundation: Communication of Science to the General Public
- 1982 Harvey Lecturer, The Rockefeller University
- 1984 3M Life Sciences Award: Significant Contributions to the Health and Welfare of Mankind
- 1985 The Ernst W. Bertner Memorial Award, The University of Texas System Cancer Center, University of Texas at Houston
- 1985 California Scientist of the Year
- 1985 One of the Science Digest's 100 Top Innovators: Development of Highly Sophisticated Instruments for the Synthesis and Analysis of Genes and Proteins
- 1986 Analytical Prize, German Society for Clinical Chemistry Award: "The Development of Microchemical Facilities for High-Sensitivity Protein Sequencing
- 1986 Doctor of Science Honorary Degree, Montana State University, Bozeman, Montana
- 1987 Louis Pasteur Award for Medical Innovation: "Studies that Bring New Perceptions of Nature and Impact Medicine in the Future
- 1987 Fellow of the American Association for the Advancement of Science: "Studies in Molecular Immunology and the Development of Techniques in Protein and Nucleic Acid Chemistry
- 1987 ARCS' Man of Science for Pioneering Research: "Deciphering the Message of DNA"
- 1987 Isco Award for Significant Contributions to the Field of Biochemical Instrumentation, University of Nebraska-Lincoln
- 1987 Doctor of Science Honorary Degree, Mt. Sinai School of Medicine of the City University of New York
- 1987 Dickson Prize in Medicine for Contributions to Immunology and Molecular Biology
- 1987 Albert Lasker Basic Medical Research Award for Studies of Immune Diversity
- 1988 Distinguished Service Award of the 1988 Miami BIO/TECHNOLOGY Winter Symposium for Pioneering the Automation of Protein and DNA Sequencing and Synthesis
- 1988 Rabbi Shai Shacknai Memorial Prize in Immunology and Cancer Research, Hebrew University
- 1988 Doctor of Science Honorary Degree, University of British Columbia, Vancouver
- 1989 Commonwealth Award of Distinguished Service for Work in Developing Instruments Used to Study Modern Biology and Medicine
- 1989 Doctor of Science Honorary Degree, University of Southern California, Los Angeles, California

- 1989 The Cetus Award for Biotechnology, ASM
- 1989 Steven C. Beering Award, Indiana University School of Medicine
- 1990 Doctor of Humane Letters Honorary Degree, Johns Hopkins University
- 1990 American College of Physicians Award for Distinguished Contributions in Science as Related to Medicine
- 1991 Franz Groedel Medal, American College of Cardiology
- 1992 Fellow of the International Institute of Biotechnology, Canterbury, Kent, UK
- 1992 Fifth Annual Duke University Award for Immunologic Research
- 1992 Doctor of Science Honorary Degree, Wesleyan University
- 1993 Scientist of the Year, Research and Development Magazine
- 1993 Initiatives in Technology Award, Partners in Public Education
- 1993 CIBA-GEIGY DREW Award in Biomedical Research, Drew University
- 1994 Lynen Medal, Miami Bio/Technology Winter Symposium
- 1994 Johns Hopkins University Distinguished Alumnus Award
- 1994 American Association for Clinical Chemistry National Lectureship Award
- 1994 National Biotechnology Venture Award
- 1995 Honorary Doctorate of Science, Whitman College, Walla Walla, WA
- 1997 UCLA Gold Medal for Contributions to Science and Medicine
- 1997 Fellow of the American Academy of Microbiology
- 1997 Laguna Niguel Hall of Fame Award for Development of Automated Sequencing and Synthesis of DNA
- 1998 Beckman Lecturer Award, Association for Laboratory Automation for Pioneering and Original Research in Automation
- 1998 Distinguished Service Award, National Association of Biology Teachers
- 1999 Honorary Elected Member, American Association for Clinical Chemistry
- 1999 Forbes Magazine's Top 25 Most Influential Biotech Leader
- 1999 Honorary Doctorate of Science, Bates College, Lewiston, ME
- 2000 Edman Award, Methods of Protein Structure Analysis (MPSA) 13th International Congress, Charlottesville, Virginia
- 2001 The New York Academy of Medicine Award for Discovery in the Service of Health, New York, NY
- 2001 The Society for Biomolecular Screening (SBS) Award for Achievement in Biomolecular Screening and Lead Discovery
- 2001 Dudley Smith Licensing Lecture Award, the Licensing Executives Society (LES)
- 2001 Honorary Doctorate of Science, The Pennsylvania State University, University Park, PA
- 2001 The Seattle Times MetroPoLIST 150: Most Influential People Who Shaped Seattle in the Past 150 Years
- 2002 Discover Magazine's 20 Biotech Geniuses
- 2002 Kyoto Prize in Advanced Technology
- 2002 *The Economist* Innovation Award for Bioscience
- 2002 Genome Technology Allstar, Most Outstanding in Sequencing Technology
- 2002 George R. Stibitz Computer Pioneer Award, Bozeman, MT
- 2003 Andrew C. von Eschenbach Lecture Award, 10th Annual Genitourinary Oncology Conference, University of Texas MD Anderson Cancer Center, Houston, TX

- 2003 Lemelson-MIT Prize for Invention and Innovation, Cambridge, MA
- 2003 World Technology Award for Biotechnology
- 2003 Howard Vollum Award for Distinguished Accomplishment in Science & Technology, Reed College, Portland, OR
- 2004 Biotechnology Industry Organization (BIO) and Chemical Heritage Foundation (CHF) 6th Annual Biotechnology Heritage Award, San Francisco, CA
- 2004 Association for Molecular Pathology (AMP) Award for Excellence in Molecular Diagnostics, Los Angeles, CA
- 2004 Honorary Professor, Zhejiang University, China
- 2004 Honorary Professor, Tsinghua University, China
- 2004 Honorary Director, Medical Systems Biology Research Center, Tsinghua University School of Medicine, China

Memberships in Professional Organizations:

American Academy of Arts and Sciences
 American Academy of Microbiology (American Society for Microbiology), Fellow
 American Association for the Advancement of Science
 American Association for Clinical Chemistry, Honorary Member
 American Association of Immunologists
 American Chemical Society
 American Institute for Medical and Biological Engineering (AIMBE), College of Fellows
 American Medical Association
 American Philosophical Society
 American Society for Biochemistry and Molecular Biology
 Association of American Physicians
 Association for Laboratory Automation
 Institute of Medicine, National Academy of Sciences
 International Society of Molecular Evolution
 National Academy of Sciences
 Sigma Xi
 Society for Integrative and Comparative Biology
 World Technology Network, Fellow

Lectureships:

- 1974 Welch Foundation Conference on Chemical Research, Houston
- 1977 Distinguished Lectureship, Department of Zoology, University of Texas-Austin
- 1979 Mary Huling Edens Lecturer in Medical Genetics, Galveston
- 1980 Philips Lecturer, Haverford
- 1980 Howard Taylor Ricketts Lecturer, University of Chicago
- 1980 Camille and Henry Dreyfus Lecturer, Pomona College
- 1980 Kinyoun Lecturer, National Institutes of Health
- 1980 Smith Kline and French Lecturer, Vanderbilt University
- 1981 Dan Campbell Lecturer, Asilomar

- 1981 Michael Heidelberger Lecturer, Columbia University
- 1981 Shaffer Lecturer, Washington University School of Medicine
- 1981 Watkins Lecturer, Wichita State University
- 1981 Stanhope Bayne-Jones Memorial Lecturer, Johns Hopkins Medical School
- 1981 Burroughs Wellcome Lecturer, Mt. Sinai Medical School
- 1981 Jesse Beams Memorial Lecturer, University of Virginia Medical School
- 1981 Robert W. Woodruff Lecturer, Emory University
- 1982 John M. Chemerda Lecturer, The Pennsylvania State University
- 1982 Marrs McLean Lecturer, Baylor College of Medicine
- 1982 Carter-Wallace Lecturer, Princeton University
- 1982 Smith-Kline Lecturer, Philadelphia
- 1982 Sommer Memorial Lecturer, Portland
- 1982 Dreyfus Distinguished Lecturer, Indiana University
- 1982 Visiting Professor of Biochemistry, University of California, Riverside
- 1982 Dreyfus Distinguished Lecturer, St. Olaf College
- 1983 Linus Pauling Lecturer, Stanford University
- 1983 Wendell Griffith Lecturer, St. Louis University
- 1983 Syme Lecturer, Walter and Eliza Hall Institute of Medical Research, Melbourne
- 1983 Allied Lecturer, Rutgers University
- 1983 Smith Kline and French Lecturer, University of California, San Francisco
- 1983 Benjamin Knox Rachford Memorial Lecturer, University of Cincinnati
- 1983 Belfort Lecturer, Purdue University
- 1983 Stuart Memorial Lecturer, Brown University
- 1984 Charles Heidelberger Memorial Lecturer, University of Southern California
- 1984 Albert Coons Memorial Lecturer, Harvard Medical School
- 1984 Nellie Fox Distinguished Lecturer, Northwestern Medical School
- 1984 President's Lecturer, Texas A&M
- 1986 J.S. Blumenthal Lecturer, University of Minnesota
- 1986 Wellcome Visiting Professor, University of Michigan
- 1986 Barton Lecturer, University of Oklahoma
- 1986 Maurice Ogur Memorial Lecturer, Southern Illinois University at Carbondale
- 1986 Nieuwland Lecturer in Biological Sciences, the University of Notre Dame
- 1986 R.E. Dyer Lecturer, Bethesda, Maryland
- 1987 Rennebohm Lecturer, University of Wisconsin, Madison
- 1987 The Committee of the Interscience Conference on Antimicrobial Agents and Chemotherapy Lecturer, New York
- 1987 Albert M. Snell Memorial Lecturer, Research Institute, Palo Alto Medical Foundation
- 1987 The 1987 Benedum Lecturer, West Virginia University
- 1987 Herman Beerman Lecturer, The Society for Investigative Dermatology
- 1988 Rabbi Shai Shacknai Memorial Prize Lectureship, Hebrew University
- 1988 James M. Craig Memorial Lecturer, Oregon State University
- 1989 Wayne State University Distinguished Lecturer for the Center of Molecular Biology
- 1989 H. Willard Davis Lecturer, The University of South Carolina
- 1989 The Cape Lecturer, McGill University

- 1989 Jeanette Oshman Efron Lecturer in Molecular Genetics, Baylor College of Medicine
- 1989 Myron Karon Lecturer, Childrens Hospital of Los Angeles
- 1989 Los Angeles Society of Pathologists Lecturer, Los Angeles
- 1990 Visiting Scholar, National Institute of Dental Research, NIH
- 1990 John G. Reinhold Lecturer, University of Pennsylvania
- 1990 Bristol Myers Lecturer, University of Colorado, Boulder
- 1990 Hobart H. Willard Lectureship in Analytical Chemistry, University of Michigan
- 1990 Roy and Eva Hong Lectureship in Molecular Biology, University of Illinois
- 1990 Jeanette Piperno Memorial Lectureship, Temple University
- 1990 Microbiology Graduate Students Distinguished Lecturer, Iowa State University
- 1990 Basil Staples Visiting Professorship, University of Maine
- 1990 Bren Fellows Lectureship, University of California, Irvine
- 1991 Leo S. Weil Memorial Lecturer, Touro Infirmary, Tulane Medical Center and Louisiana State University Medical Center, New Orleans
- 1991 Jessie & John Danz Lectureship, University of Washington
- 1991 Kosuge Memorial Lectureship, University of California, Davis
- 1991 Franz Groedel Lecturer, Opening Plenary Session, American College of Cardiology
- 1991 Hoffman-LaRoche Lectureship in Microbiology, the Waksman Institute, Rutgers University
- 1991 The Aser Rothstein Lecturer, Research Institute of the Hospital for Sick Children, Toronto, Canada
- 1991 Distinguished Medical Scientist Lecturer, Ohio State University
- 1991 Richard S. Polacsek Lecturer, Welch Medical Library, Johns Hopkins University
- 1992 William Weigle Memorial Lecturer, Scripps Research Institute
- 1993 Hooke Lecturer, XVI Congress of the Int'l Society for Analytical Cytology
- 1993 Serono Lecturer, American Society of Andrology
- 1993 Beirne B. Carter Lecturer in Immunology, University of Virginia
- 1993 Charles C. & Mary Elizabeth Lovely Verstandig Distinguished Visiting Professor, University of Tennessee Memphis
- 1994 Feodor Lynen Lecturer, The Miami Bio/Technology Winter Symposium
- 1994 Dennis Memorial Lecturer, Baylor College of Medicine
- 1994 Baker Lecturer, American Laryngological Association
- 1994 R.V. Pole Memorial Lecturer, Conference on Lasers and Electro-Optics
- 1994 Ramon Guiteras Lecturer, American Urological Association, Inc.
- 1994 Ernest Cotlove Lecturer, Academy of Clinical Laboratory Physicians and Scientists
- 1994 Lansdowne Lecturer, University of Victoria
- 1994 Zickler Lecturer, State University of New York at Stony Brook
- 1995 Howard Steel Lecturer, Pediatric Orthopaedic Society of North America
- 1995 Phi Beta Kappa Lecturer, Whitman College
- 1995 Paulette Shirley Pritchett Lecturer, University of Alabama at Birmingham
- 1995 Matthew T. Moore Distinguished Lecturer, American Association of Neuropathologists
- 1995 Neel Distinguished Research Lecturer, American Academy of Otolaryngology Head and Neck Surgery
- 1995 I.S. Ravdin Lecturer in Basic Sciences, Clinical Congress of the American College of

Surgeons

- 1995 Pokar Kabra Lecturer, University of California, San Francisco
- 1996 Watkins Visiting Professor, Wichita State University
- 1996 Marlene DeLuca Memorial Lecturer, University of California, San Diego
- 1996 O'Leary Visiting Scientist Lecturer, Gonzaga University
- 1997 John P. McGovern Lecturer, Baylor College of Medicine
- 1997 Harvey Lecturer, Rockefeller University
- 1997 Takeru Higuchi Memorial Lecturer, University of Kansas, Lawrence
- 1997 Tadeus J. Wiktor Memorial Lecturer, The Wistar Institute, Philadelphia
- 1998 Walter J. Burdette Lecturer in Medical Science, Yale University Maurice M. Burkholder Lectureship in Oncology, Mountain States Medical Research Institute
- 1998 Eli Lilly Visiting Lecturer, Indianapolis, Indiana
- 1998 Apsler Lecturer, Clark College
- 1999 Heeley Lecturer, The Lawrenceville School
- 1999 Centre for Medicine Research (CMR) International Annual Lecturer, Royal College of Physicians, London
- 1999 MPS Distinguished Lecturer, National Science Foundation
- 1999 Michael Kriegler Memorial Lecturer, University of California, San Diego
- 1999 John C. Krantz, Jr. Distinguished Lecturer, The University of the Sciences in Philadelphia
- 1999 Wilkins Visiting Professor, Boston University Medical Center
- 1999 Willit F. Whitmore Jr. Lecturer, American Urological Association, Dallas, Texas
- 1999 Ørsted Lecturer, Technical University of Denmark
- 1998 Storer Life Sciences Lecturer, University of California Davis
- 2000 Paul D. Lamson Memorial Lecturer, Vanderbilt University
- 2000 John & Betty Moore Lecturer on "Science as a Way of Knowing," University of California, Riverside
- 2000 Stevenson Memorial Lecturer, The University of Western Ontario
- 2000 John C. Krantz, Jr. Distinguished Lecturer, The University of the Sciences in Philadelphia
- 2000 G.F. Smith Lecturer, University of Illinois, Urbana
- 2000 Simon Stevin Lecturer, the Delft University of Technology, The Netherlands
- 2001 Alfred Deakin Lecturer, Melbourne, Australia
- 2001 Commencement Speaker, The Pennsylvania State University, "The Challenge of Change"
- 2002 6th Andrew H. Weinberg Lecturer, Dana-Farber Cancer Institute, Boston, Massachusetts
- 2002 David Perlman Lecturer for Leadership in the Emerging Field of Systems Biology, for the Division of Biochemical Technology (BIOT) at the American Chemical Society (ACS) National Meeting
- 2003 Waddell Memorial Lecturer, Arizona Cancer Center, Tucson, AZ
- 2003 Andrew C. von Eschenbach Lecture, The University of Texas MD Anderson Cancer Center, Houston, TX
- 2003 Hunter Lecture in Bioengineering, Clemson University, Clemson, SC

- 2003 E. Llewellyn-Thomas Scientific Lecturer, Institute of Biomaterials & Biomedical Engineering, University of Toronto, Ontario
- 2003 American Thoracic Society (ATS) President's Lecture, Seattle, WA
- 2003 Provost's Lecture, Purdue University Sigma Xi, West Lafayette, IN
- 2003 Jack Peter Green Lecturer, Mt. Sinai Medical Center, New York, NY
- 2003 Si Ramo Lecturer, Keck Graduate Institute of Applied Life Sciences, Claremont, CA
- 2003 Janice Antoine Lumpkin Memorial Lecturer, University of Maryland Baltimore County, Baltimore, MD
- 2004 17th Schrodinger Lecturer, Imperial College of Science, Technology and Medicine, London
- 2004 Florence S. Mahoney Lecture on Aging, National Institutes of Health, Bethesda, MD

Editorial Advisory Duties:

- 1970-1975 Advisory Editor, *Immunochemistry*
- 1975-1981 Editorial Advisory Board, *Biochemistry*
- 1975-1980 Advisory Board, *Biochemical Genetics*
- 1975-1980 Editorial Board, *Biological Regulation and Control: A Comprehensive Treatise* (Plenum)
- 1980-1975 Associate Editor, *Journal of Immunology*
- 1981-1985 Associate Editor, *Cell*
- 1981-1999 Editorial Board, *Journal of Molecular Evolution*
- 1986-1996 Editorial Board, *Proteins: Structure, Function and Genetics*
- 1987-1989 Advisory Board, *Clinical Immunology and Immunopathology*
- 1988-2003 Editorial Board, *Genomics*
- 1988-1999 Editorial Board, *BioTechniques*
- 1990-1995 Editorial Board, *Genetic Analysis and Applications*
- 1990-Present Editorial Board, *Current Opinion in Biotechnology*
- 1991-1999 Editorial Board, *Molecular Phylogenetics and Evolution*
- 1991-Present Advisory Editor, *Human Mutation*
- 1993-1999 Editorial Board, *Proteins*
- 1994-Present Editorial Board, *Journal of Computational Biology*
- 1994-Present Editorial Board, *Molecular Medicine*
- 1995-1999 Editorial Committee, *Methods in Molecular and Cellular Biology*
- 1995-2001 Editorial Board, *Molecular Biotechnology*
- 1995-Present Associate Editor, *Genome Science and Technology*
- 2000-Present Advisor, *Encyclopedia of the Human Genome*
- 1998-Present Editorial Board, *Annual Reviews of Human Genetics and Genomics*
- 1999-Present Editorial Associate Board, *GeneScreen*
- 1999-Present Advisory Board, *Genome Biology*
- 1999-Present Editorial Board, *Functional and Integrative Genomics*
- 2000-Present Advisory Board, *Data-Rich Genomics Series*, Oxford University Press
- 2000-Present Advisor, *SoundVisions Productions*

Scientific Advisory Duties:

1972-1976	Study Section of Human Biology Program, National Science Foundation
1973-1977	Special Grants Committee, American Cancer Society, California Division
1975-1977	Chairman, Special Grants Committee, American Cancer Society, California Division
1975	Chairman of FASEB Conference on Genetics and Biological Evolution
1979-1981	Genetics Study Section, National Institutes of Health
1979-1984	Visiting Committee for the Department of Biology, MIT
1980	Committee to Select California Scientist of the Year
1980-1985	Scientific Advisory Board, Max-Planck-Institut für Experimental Medizin at Göttingen
1981	Chairman, Committee to Select California Scientist of the Year
1982-1987	Visiting Committee for Cellular and Developmental Biology, Harvard University
1985-1990	Scientific Advisory Board, Cleveland Clinic
1987-1992	Scientific Advisory Committee, Cancer Center at the University of Chicago
1987-1991	Scientific Advisory Committee, Department of Medicine, University of Alabama
1987-1999	External Advisory Committee, USC Comprehensive Cancer Center
1989-1992	Genome Advisory Committee, National Institutes of Health
1989-1999	Genome Advisory Committee, Department of Energy
1989-1994	Commission on Life Sciences, National Academy of Sciences
1989-1997	Executive Committee, Human Genome Organization
1989-1992	California Council on Science and Technology
1990-1994	Board of Scientific Advisors, Jane Coffin Childs Memorial Fund
1990-1992	Science Advisory Board, Discovery Museum of Orange County
1990-1999	Scientific Advisory Board for Biological Sciences, Molecular Simulations, Inc.
1990-1999	Advisory Board, Network of Centres of Excellence, University of British Columbia
1991-1999	Advisory Board, Human Genome Center, Lawrence Berkeley Laboratory
1991-1999	Board of Directors, Sigma Xi
1991-1997	Board of Directors, The Canadian Genetic Disease Network
1992-Present	Board of Directors, The Seaver Institute
1993-1999	Executive Committee, Medical Scientist Training Program, University of Washington
1993-1999	Science Policy Symposium Committee
1995-1999	Scientific Advisory Board, CaP CURE Association
1995-1998	National Advisory Council for Human Genome Research, National Institutes of Health
1995-1999	Governing Board, National Nanofabrication, National Science Foundation
1995-1999	Committee for the Faculty Seminar in Science and Technology Policy
1995-2003	Biological & Environmental Research Committee (BERAC), Department of Energy
1996-2002	Board of Directors, Washington Biotechnology & Biomedical Association

1997-1998	Committee on Science Education K-12, National Research Council
1998-1999	Scientific Advisory Committee, Oak Ridge National Labs, Life Sciences Division
1999-2002	National Council on Science & Technology Education
1999-2002	Laboratory Advisory Committee, Pacific Northwest Laboratory
2000-Present	Scientific Advisory Board, Burnham Institute
2000-Present	Chief Scientific Advisor, California Institute for Systems Biology, University of California, Irvine

Research Interests:

Genetics and Evolution of Multigene Systems
 Genetics and Evolution of Antibody Diversity
 Organization of Antibody and MHC Genes
 Chemistry and Genetics of Eukaryotic Membrane Proteins
 Protein Evolution
 Protein Chemistry and Immunochemistry
 Microchemical Instrumentation

Non-Scientific Interests:

Mountaineering and climbing
 Running

Photography
 Science fiction

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A. Patents

1. Hood, L. E. and M. W. Hunkapiller. (1981) Apparatus for the Performance of Chemical Processes. U.S. Patent No. 4,252,769.
2. Hood, L. E., M. W. Hunkapiller, W. J. Dreyer, R. M. Hewick, and A. W. Stark. (1986) Method for the Sequential Performance of Chemical Processes. U.S. Patent No. 4,603,114.
3. Hood, L.E., M.W. Hunkapiller, W.J. Dreyer, R.M. Hewick, and A.W. Stark. (1986) Conversion Flask for Sequential Performance Apparatus. U.S. Patent No. 4,610,847.
4. Hood, L.E., M.W. Hunkapiller, W.J. Dreyer, R.M. Hewick, and A.W. Stark. (1987) Apparatus for the Sequential Performance of Chemical Processes. U.S. Patent No. 4,704,256.
5. McGrath, M.S., I.L. Weissman, and L. Hood. (1988) Diagnostic and Therapeutic Aspects of Receptor-Mediated Leukemogenesis. U.S. Patent No. 4,786,590.

6. Hood, L. E., I. L. Weissman and M. S. McGrath. (1989) Diagnostic Reagents Based on Unique Sequences Within the Variable Region of the T Cell Receptor and Uses Thereof. U.S. Patent No. 4,886,743.
7. Landegren, U. and L. Hood. (1991) Method of Detecting a Nucleotide Change in Nucleic Acids. U.S. Patent No. 4,988,617.
8. Smith, L.M., L.E. Hood, M.W. Hunkapiller, and T.J. Hunkapiller. (1992) Automated DNA Sequencing Technique. U.S. Patent No. 5,171,534.
9. Smith, L.M., L.E. Hood, M.W. Hunkapiller, and T.J. Hunkapiller. (1998) Automated DNA Sequencing Technique. U.S. Patent No. 5,821,058.
10. Li, L. and L. Hood. (2000) Human Jagged Polypeptide, Encoding Nucleic Acids and Methods of Use. U.S. Patent No. 6,136,952.
11. Smith, L.M., L.E. Hood, M.W. Hunkapiller, T.J. Hunkapiller and C.R. Connell. (2001) Tagged Extendable Primers and Extension Products. U.S. Patent No. 6,200,748 B1.
12. Prusiner, S.B., P.Tremblay, R. Moore, D. Westaway, L.E. Hood and I. Lee. (2001) PrP-Like Gene. U.S. Patent No. 6,277,970 B1.
13. Loeb, L.A., L. Hood and M. Suzuki. (2002) Thermostable Polymerase Having Altered Fidelity and Method of Identifying and Using Same. U.S. Patent No. 6,395,524 B2.
14. Hood, L.E. and T.E. Ideker. (2003) Multiparameter Integration Methods for the Analysis of Biological Networks. U.S. Patent No. 2003/0130798 A1.

B. Books and Book Chapters

1. Sanders, B. G. and L. Hood. (1971) Antigenic Properties and Electrophoretic Heterogeneity of Polypeptide Chains from IgG Immunoglobulins. **Studies in Genetics VI**, 29-47. Ed. M. R. Wheeler. University of Texas Publications, Austin, Texas.
2. Wood, W. B., J. Wilson, R. Benbow and L. Hood. (1974) 1st Edition, (1981) 2nd Edition. **Biochemistry: A Problems Approach**. Benjamin, Inc., Menlo Park, CA.
3. Hood, L., J. Wilson and W. B. Wood. (1975) **Molecular Biology of Eucaryotic Cells**. W. A. Benjamin, Inc., Menlo Park, CA.
4. Silver, J. and L. Hood. (1976) Genetic and Evolutionary Implications of the Partial Amino Acid Sequences of H-2K and H-2D Alloantigens. **The Role of Products of the Histocompatibility Gene Complex in Immune Responses**, 677-689. Academic Press, Inc.
5. Cecka, M., M. McMillan, D. Murphy, J. Silver, H. McDevitt and L. Hood. (1978) Partial Amino Acid Sequence Analyses of Ia Molecules. **IrGenes and Ia Antigens**, 275-286. Academic Press, Inc.
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8. Davis, M., P. Early, K. Calame, D. Livant and L. Hood. (1979) The Organization and Rearrangement of Heavy Chain Immunoglobulin Genes in Mice. **Eucaryotic Gene Regulation**, 393-406. Academic Press, Inc.

9. Strader, C. D., M. W. Hunkapiller, L. E. Hood and M. A. Raftery. (1980) Determination of the Subunit Stoichiometry of the Acetylcholine Receptor from *Torpedo californica* by Amino Terminal Sequence Analysis. **Psychopharmacology and Biochemistry of Neurotransmitter Receptors**, 35-46.
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11. Kronenberg, M., E. Kraig, S. J. Horvath and L. E. Hood. (1982) Cloned T Cells as a Tool for Molecular Geneticists: Approaches to Cloning Genes which Encode T Cell Antigen Receptors. **Isolation, Characterization, and Utilization of T Lymphocyte Clones**, 467-491. Academic Press, Inc.
12. Huang, H. and L. Hood. (1983) Origins of Antibody Diversity. **Recombinant DNA and Medical Genetics**, 97-104.
13. Hood, L. E., Weissman, I. L., Wood, W. B. and Wilson, J. H. (1984) **Immunology**. 2nd Edition. Benjamin/Cummings, Menlo Park, CA.
14. Kent, S. B. H., L. E. Hood, H. Beilan, S. Meister and T. Geiser. (1985) High Yield Chemical Synthesis of Biologically Active Peptides on an Automated Peptide Synthesizer of Novel Design. **Peptides 1984**, 185-188.
15. Zuniga, M. C. and L. Hood. (1985) Membrane Expression and Function of MHC Class I Antigens with Truncated or Altered Cytoplasmic Tails. **Cell Biology of the Major Histocompatibility Complex**, 73-79.
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18. Hood, L. and L. Smith. (1987) Genome Sequencing: How to Proceed. **Issues in Science and Technology**, Vol. III, Number 3, 36-46.
19. Aebersold, R., D. B. Teplow, L. E. Hood and S. B. H. Kent. (1987) A Novel Approach to Isolation of Proteins for Microsequence Analysis: Electrophoretic Transfer onto Activated Glass. **Proteins**, 105-119. Ed. James J. L'Italien. Plenum Publishing Corporation.
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22. Korber, B., L. Hood and I. Stroynowski. (1987) Regulatory Elements in the Promoter of the H-2D^a Class I Gene. **H-2 Antigens**, 201-208. Ed. Chella S. David. Plenum Publishing Corporation.
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35. Hood, L. and R.A. McIndoe. (1997) DNA Diagnostics: Paradigm Changes and Systems Analysis. **The Medical Challenge. Complex Traits**, 11-54. Eds. E. Peter Fischer and G. Möller. Piper Verlag GmbH, München.
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41. Nickoloff, B. (2000) **Methods in Molecular Medicine. Melanoma Techniques and Protocols: Molecular Diagnosis, Treatment, and Monitoring**. Foreword by L. Hood. Ed. B.J. Nickoloff. Humana Press Inc., Totowa, NJ.
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C. Proceedings

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7. Hood, L. E., R. Aebersold, M. Harrington, T. Hunkapiller, R. Kaiser, S. B. Kent, U. Landegren and H. Nika. (1989) Protein Chemistry and the Biotechnology of the Future. **Methods in Protein Sequence Analysis**, 536-553. *Proceedings of the 7th International Conference, Berlin, July 3-8, 1988*. Ed. Brigitte Wittmann-Liebold. Springer-Verlag.
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F. Papers In Press or Submitted

- Halvorsen, O.J., A.M. Oyan, T.H. Bo, S. Olsen, K. Rostad, S.A. Haukaas, A.M. Bakke, B. Marzolf, K. Dimitrov, B. Lin, I. Jonassen, L. Hood, L.A. Akslen, and K-H Kalland. (2003) Expression of Transcription Factors NR4A1 and NFIX is Associated with Aggressive Prostate Cancer. *International Journal of Cancer*. In press.
- Halvorsen, O.J., A.M. Oyan, T.H. Bo, S. Olsen, K. Rostad, S.A. Haukaas, A.M. Bakke, B. Marzolf, K. Dimitrov, L. Stordrange, B. Lin, I. Jonassen, L. Hood, L.A. Akslen, and K-H Kalland. (2004) Gene Expression Profiles in Prostate Cancer: Association with Patient Subgroups and Tumor Differentiation. *International Journal of Oncology*. In press.
- Utle, A.G., R. Vessella, P.H. Lange, L. Hood and B. Lin (2004) A Prostate-Specific Blood Marker for Prostate Cancer: Towards Multiparameter Blood Diagnostics. *Nature Medicine*. Submitted.
- Lin, B., J.T. White, W. Lu, T. Xie, A.G. Utleg, X. Yan, E.C. Yi, P. Shannon, I. Khrebtukova, P.H. Lange, D.R. Goodlett, D. Zhou, T.J. Vasicek and L. Hood (2004) Evidence for the Presence of Disease-Perturbed Networks in Prostate Cancer Cells by Genomic and Proteomic Analysis: A Systems Approach to Disease. *Cancer Research*. Submitted.

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Employment:**

9/89 - Present - Professor, University of Washington at Seattle: Departments of Management Science and Finance.

9/83 - 9/89 - Associate Professor, University of Washington at Seattle: Department of Management Science (starting 7/85); Department of Finance (starting 7/85); Department of Finance, Business Economics and Quantitative Methods (9/83 - 7/85); Department of Statistics (9/83 - 6/87).

9/79 - 8/83 - Assistant Professor, Department of Statistics, Princeton University.

9/77 - 5/79 - Assistant Professor, Department of Statistics, University of Wisconsin at Madison.

Education:

1975 - 77 - Ph.D., Stanford University, Department of Statistics.

1973 - 75 - M.S., Stanford University, Department of Mathematics.

1969 - 73 - B.A., Boston University, Summa Cum Laude with Distinction in Mathematics and Physics.

**Honors and
Awards:**

Grant I. Butterbaugh Professorship, 1993-present.

Burlington Northern Foundation Faculty Achievement Award, 1992.

Research Associate, Center for the Study of Futures Markets, Columbia University, 1988.

Excellence in Teaching Award, Executive MBA Program, University of Washington, 1988.

Research Opportunities in Auditing Award, Peat Marwick Foundation, 1987.

Burlington Northern Foundation Faculty Achievement Award 1986.

Excellence in Teaching Award, Executive MBA Program, University of Washington, 1986.

Professor of the Quarter, MBA Program, University of Washington, Fall, 1983.

Phi Beta Kappa, elected 1973.

Sigma Xi, elected 1973.

Robert E. Bruce Prize for Excellence in Mathematics, 1973.

Visiting,
Adjunct, and
Other Positions:

9/89 - present - Adjunct Professor of Statistics, University of Washington at Seattle.

9/01 - 6/02 - Adjunct Professor of Genome Sciences, University of Washington at Seattle.

4/99 - 9/01 - Adjunct Professor of Molecular Biotechnology, University of Washington at Seattle.

4/97-6/97 - Visiting Professor, Université de Paris I - Pantheon-Sorbonne, France.

4/96-5/96 and 3/94-5/94 - Visiting Professor, Faculté de Science Economique et de Gestion, Université de Bourgogne, France.

9/89 - 12/90 - Secretary-Treasurer, Business and Economic Statistics Section, American Statistical Association.

6/87 - 9/89 - Adjunct Associate Professor of Statistics, University of Washington at Seattle.

9/83 - 9/89 - Adjunct Associate Professor of Zoology, University of Washington at Seattle.

8/82 - 8/83 - Visiting Assistant Professor of Biostatistics and Visiting Scholar of Statistics, University of Washington at Seattle.

6/81 - 8/81 - Visiting Scholar, Department of Statistics, University of Washington at Seattle.

6/80 - 8/80 - Visiting Scholar, Department of Statistics, Stanford University.

5/79 - 8/79 - Visiting Staff Member, Statistics Group, Los Alamos Scientific Laboratories.

9/78 - 5/79 - Research Fellow, Department of Biostatistics, Harvard University.

6/78 - 8/78 - Visiting Research Associate, Department of Paleobiology, Smithsonian Institution.

9/77 - 6/78 - Postdoctoral Fellow, Mathematics Research Center, University of Wisconsin at Madison.

6/77 - 9/77 - Acting Instructor and Research Associate, Statistics Department, Stanford University.

6/76 - 9/76 - The RAND Corporation.

7/75 - 8/75 - Instructor, Department of Mathematics, Boston University.

Research Support:

1984 - 04 - Summer Research Grants: Business School, University of Washington.

2001 - CIBER Summer Fellowship: Center for International Business Education and Research, University of Washington.

1995, 97 - 99 - Summer Research Support: Department of Molecular Biotechnology, University of Washington.

1992 - Summer Research Grant: Center for the Study of Financial Management, University of Washington.

1985 - 91 - Summer Research Grants: Center for the Study of Banking and Financial Markets, University of Washington.

1979 - 83 - Co-Principal Investigator, U.S. Army Research Office Contract to Princeton University.

1979 - 82 - Higgins Research Fund Support, Princeton University.

1978 - 79 - National Science Foundation National Needs Postdoctoral Fellowship.

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1975 - 77 - Traineeship, National Institute of Health.

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Proficient in Excel, Windows, Pascal, C, Fortran, Visual Basic, and computer assembly languages.

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References,
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PUBLICATIONS

- 1977 Random Coverage Problems in Geometrical Probability with an Application to Time Series Analysis. Ph.D. Thesis, Department of Statistics, Stanford University.
- 1978 Random Space Filling and Moments of Coverage in Geometrical Probability. (1978). Journal of Applied Probability **15**, 340-355.
- 1978 Random Arcs on the Circle. Journal of Applied Probability **15**, 774-789.
- 1979 Asymptotic Coverage Distributions on the Circle. Annals of Probability **7**, 651-661.
- 1979 The Noncentral Chi-Squared Distribution with Zero Degrees of Freedom and Testing for Uniformity. Biometrika **66**, 381-386.
- 1980 Testing for Periodicity in a Time Series. Journal of the American Statistical Association **75**, 345-348.
- 1980 Degeneracy when DNA Codes for Overlapping Genes. Mathematical Biosciences **49**, 1-16. (with W.M. Fitch).
- 1980 Modeling Hydrocarbon Reservoirs: Parametrization, Validation, and Prediction. Technical Report LA-UR-80-2508, Los Alamos Scientific Laboratories. (with C.J. Nachtsheim).
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- 1982 Geometric Data Analysis: an Interactive Graphics Program for Shape Comparison. In Modern Data Analysis, edited by R.L. Launer and A.F. Siegel, 103-122. New York: Academic Press.
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